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Atmospheric Measurement Techniques Discussions

Interactive comment on "Looking through the haze: evaluating the CALIPSO level 2 aerosol optical depth using airborne high spectral resolution lidar data" *by* R. R. Rogers et al.

R. R. Rogers et al.

rrr1980@gmail.com

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Thank you for your comments and suggestions. We've made the minor changes you suggested and the supplement attached contains additional clarification for some of the points you made.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 6141, 2014.

Author responses to reviewer #2

P6146, L6: "the next step will be to apply this validation strategy to the aerosol profile product and the vertical distribution of extinction ". It looks like the authors refer to the fact that they have looked at the CALIOP L2 layer product only and the next step is the evaluation of the CALIOP profile product. This statement comes before the description of L2 CALIOP layer vs profile product of section 2.1 which might make it difficult for the reader to understand the distinction.

Added a pointer so confused readers can skip ahead, thank you!

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P6153, L25: "Secondly, any CALIOP 5 km profile containing a nonzero cloud optical depth or an HSRL detected cloud was excluded from the comparison." We found very recently that although some cloud COD were equal to -9999 (i.e. potentially cloud-free profiles), those same profiles where showing high QA cloud features on the vertical (i.e. detected in the V3 Atmospheric_Volume_Description, one example is line #485 in CAL_LID_L2_05kmAPro-Prov-V3-01.2006-08-01T00-40-33ZN.hdf). This was found in the CALIOP profile product. We do not know if it figures in the layer product as well. The authors might be aware of such a bug. In any case, their HSRL-CALIOP dataset should be safe from any CALIOP cloud contamination due to the AOD > 0.5 criterion.

We are aware of this bug and verified that none of the data files used in this analysis were affected by it. As you say the AOD > 0.5 would limit cloud contamination.

P6154, L29: I suggest "Table 2 also highlights the statistics of the SIBYL layer detection at night relative to the daytime (i.e. more aerosol layers and detected with less horizontal averaging)"

P6155, L1: "HSRL spent 45 h on track during the nighttime and
100 h on track during the daytime although counting layers is perhaps not the best measure of the SIBYL's efficacy." The link between the HSRL flight hours and the SIBYL detected layers is not clear.

All we mean to reiterate is that the daytime and nighttime detection thresholds are different, so HSRL spending 45 hrs along track at night is going to yield different statistics compared to the daytime, but really trying to put a quantitative number to this is meaningless since the averaging scales of CALIOP are different for day and night. The line now reads, "**Error! Reference source not found.** also highlights the statistics of the SIBYL layer detection at night relative to the daytime. There were more aerosol layers and detected with less horizontal averaging at night relative to day, despite that fact that HSRL spent ~45 hrs on track during the nighttime and ~100 hrs on track during the daytime; counting layers, however, is perhaps not the best measure of the SIBYL's efficacy."

Fig. 1.